"Worth the Wait?"
Measuring the Impact of Extending Unemployment Benefits on Unemployment Duration during the Great Recession

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Executive Summary

During the Great Recession, millions of Americans found themselves out of work. The federal government's response to the large increase in unemployment was to extend the number of weeks of unemployment insurance an individual may collect while unemployed. It was during this time that the nation also saw a dramatic rise in average unemployment duration to record levels. This paper seeks to determine whether the federal benefit increase was a contributing factor to the sharp rise in unemployment duration. The analysis found that extending unemployment benefits increased unemployment duration spells. When examining all duration spells, each additional week of unemployment benefits resulted in a 0.08 week increase in unemployment duration. There was evidence of a larger impact on the long-term unemployed. For every additional week of unemployment benefits, unemployment duration increased by 0.16 weeks for those individuals who had been unemployed at least 26 weeks.

1 Introduction

The average unemployment duration in the United States rose dramatically during the Great Recession, and remained at high levels after the recession had ended. The federal government responded to this crisis by extending the number of weeks of unemployment insurance benefits an unemployed individual is able to receive up to 99 weeks (Center on Budget and Policy Priorities, 2013). In 2006 the average maximum weeks of UI benefits available was about 26 weeks, and highest average maximum was just over 91 weeks in 2011. The benefit extension lasted throughout the Great Recession and just recently expired in December of 2013. This paper investigates whether the federal benefit increase was a contributing factor to the rise in unemployment duration. The maximum number of weeks of unemployment insurance an individual is eligible to receive can affect how long that person stays unemployed. If they were eligible for 99 weeks of benefits, they may have stayed unemployed longer than if they were eligible for only 26 weeks of benefits. This is an argument of moral hazard which says that having access to additional weeks of benefits can reduce the incentive to find work after becoming unemployed. If moral hazard is a problem, individuals are choosing to stay unemployed rather than return to work. The moral hazard argument will be explored in more detail later in the paper.

This paper will examine recent levels of unemployment duration and estimate the impacts different factors had on the increase in duration spells. The analysis relies on state differences in unemployment benefit eligibility to determine the impact of additional weeks of benefits on duration spells. The analysis found that extending unemployment benefits increased unemployment duration spells. When examining all duration spells, each additional week of

unemployment benefits resulted in a 0.08 week increase in unemployment duration. There was evidence of a larger impact on the long-term unemployed. For every additional week of unemployment benefits, unemployment duration increased by 0.16 weeks for those individuals who have been unemployed at least 26 weeks. Based on the increase in the average maximum weeks of UI benefits (about 65 weeks) as a result of the benefit extension, duration spells increased by about 5.26 weeks and increased duration spells for the long-term unemployed by about 10.52 weeks.[1]

2 Background: Unemployment Insurance

Unemployment Insurance (UI) is a social insurance program that provides a safety net for regularly employed workers who become unemployed through no fault of their own, and meet certain eligibility requirements (DOL, 2013). Each state operates its own unemployment insurance program and sets eligibility requirements, within federal guidelines. Unemployment benefits are calculated based on a formula that factors in an individual's wages from the previous four quarters, up to a certain level. Standard benefits provide a maximum 26 weeks of benefits to an eligible unemployed worker. To remain eligible for the program an individual must demonstrate he or she is continuing to actively seek new employment.

2.1 Funding

The benefits individuals receive from the UI program are directly funded through state payroll taxes paid by employers on behalf of their employees. Not all wages are taxed; the federal government requires that all states tax at least the first $7,000 each employee earns annually. Most states have a larger taxable wage base, ranging from the minimum $7,000 up to the high of $41,300 in Washington (American Payroll Association, 2014). Even though employers directly

[1] Prior to the Great Recession the average maximum amount of UI available was just under 26 weeks. The average maximum peaked in 2011 at just over 91 weeks. Taking the difference resulted in an increase of about 65 weeks in the maximum weeks of UI benefits.

pay the tax, economists generally assume that it is the employees who bear a greater burden of the tax (CBO, 2012, p. 23). The idea is that the dollars spent on the tax would otherwise have been used for employee wages. In effect, the cost of the UI program is passed on to currently employed workers.

In addition to the state payroll tax, the federal government also levies a tax on employers to support state UI programs through the Federal Unemployment Tax Act (FUTA) (Whittaker & Isaacs, 2014). The tax is 0.6 percent on the first $7,000 each employee earns annually (Stone & Chen, 2013). As a part of the Social Security Act of 1935, the federal government agreed to take on a role to support UI. The act states that the federal government will appropriate monies:

> "For the purpose of assisting the States in the administration of their unemployment compensation laws…" (The Social Security Act of 1935)

Regarding payments made by the federal government to the states:

> "The Board shall from time to time certify to the Secretary of the Treasury for payment to each State which has an unemployment compensation law approved by the Board under Title IX, such amounts as the Board determines to be necessary for the proper administration of such law during the fiscal year in which such payment is to be made." (The Social Security Act of 1935)

The FUTA tax funds the administration of the state programs as well as the extended benefit programs and provides a fund from which states can borrow in order to pay regular UI benefits if necessary.

2.2 Positive outcomes

Unemployment Insurance is a very beneficial public program not only for unemployed individuals but it also has positive effects for the larger economy as well (Elmendorf, 2011). For individuals, UI reduces the stress of losing a job by providing financial support for an unemployed worker and his or her family. There are many workers and their families who would fall into poverty without benefits from UI. In 2010 alone 3.2 million people were kept out of poverty by receiving unemployment benefits (Council of Economic Advisers, 2011). Losing a job can take a large negative toll on a person's life, beyond the financial impacts; there are negative psychological effects as well as negative outcomes to a person's health and well-being (American Psychological Association, 2014). UI cannot solve all of these problems but it eases the burden by providing financial assistance.

In addition to the individual level benefits, UI acts as an economic stabilizer during recessionary times by providing money to unemployed individuals who have lost their primary source of income. Most out of work individuals would normally make large cuts in their spending habits. Receiving UI mitigates those cut backs and helps smooth consumer consumption during a period of financial uncertainty. Gruber (1994) estimates that the average fall in consumption would be three times higher without a UI program than the fall in consumption with UI present. Moody's Analytics found that every dollar provided in unemployment benefits resulted in $1.55 spent in the economy, creating a multiplier effect (Green, 2013). The boost provided by the influx of cash into the economy through UI benefits helps to increase consumer demand and UI has consistently been one of the most effective policies at generating economic growth by providing a boost to demand (Elmendorf, 2011).

2.3 Extending Benefits

During economic downturns, unemployment benefits can be extended through two different programs, both of which generally only occur during times of high unemployment. Both programs only extend the number of weeks of benefits. Neither program has any effect on the dollar value of benefits an individual receives.

Extended Benefits (EB) is a joint federal-state program that started in 1970. State participation in the program is voluntary and eligibility is determined by state level unemployment rates. Two different scenarios trigger a state to provide EB. The first is if a state's unemployment rate reaches 6%, and the second is if the state's unemployment rate both reaches 5% and is at least 20% higher than the state's unemployment rate at any time during the last three years. If either occurs, then UI benefits are extended to a maximum of either 13 or 20 weeks, depending on state preferences and economic conditions (see Table 1). The Federal government covers half the cost of the additional benefits provided through the FUTA tax, although during the Great Recession the federal government covered all costs of EB. An eligible unemployed worker must first exhaust the standard 26 weeks of benefits before he or she can receive extended benefits. Once the unemployment rate falls below the trigger levels, benefits return to the standard 26 weeks (Council of Economic Advisers, 2011).

UI benefits can also be extended during recessionary times through temporary, federally administered programs. The most recent was the Emergency Unemployment Compensation (EUC), passed on June 30, 2008 in response to the Great Recession. EUC does not have an automatic trigger like the EB program does. Rather the federal government determines how the EUC will be implemented. EUC is funded by the federal government's payroll tax levy on

employers. EUC is comprised of separate tiers, each of which provides additional weeks of UI based on state unemployment levels (see Tables 1 and 2). Individuals in states where EUC benefits are in effect must first exhaust all regular and any extended state-sponsored benefits before collecting benefits from EUC. Each tier of benefits within EUC must also be exhausted before moving onto the next tier.

2.4 Current debate

When EUC expired in December 2013, about 1.3 million unemployed Americans saw their benefits end and about 4.9 million unemployed individuals received fewer weeks of benefits. Currently the federal government must decide whether to refund EUC and restore the extended UI benefits. Refunding EUC has become a highly debated issue.

Supporters of refunding EUC want to first and foremost continue to provide financial support to unemployed workers. They believe it is important to provide financial support to a vulnerable population. If benefits were not extended and unemployed workers became discouraged and dropped out of the labor force, the unemployment rate would decrease but it would be a false indication of improvement in the labor market. Continuing EUC would provide additional benefits to these discouraged workers and keep them from dropping out of the labor force. A final argument for continuing the EUC program is the weak job market. With very few available jobs, removing UI benefits would put many families in a very desperate financial position.

Those against further extending benefits point to the high costs of the program and the financial pressure it will place on those still employed as well as employers if UI payroll taxes are raised. With such a large number of individuals still unemployed (and not paying the UI payroll tax)

there are fewer workers bearing a greater share of the tax burden in order to fund the program. States who need to borrow from the federal government in order to pay UI benefits are required to repay the loan in two years. The federal government, in order to recoup loans, raised federal UI payroll tax rates on states unable to repay in time, 18 states as of 2012 (Stone & Chen, 2013; ADP, 2012). Californian employers have seen their federal payroll taxes increase as the state's UI trust fund has a deficit of $9 billion (State of California, 2013).

Another argument against EUC is that unemployment insurance, especially extending benefits, can result in higher unemployment and longer unemployment duration. The following section will expand on this argument as well as explore some other theories that have led to the dramatic rise in unemployment duration.

3 Theory

Unemployment duration in the United States has been on the rise. As Figure 1 shows, since 1967 there has been a steady upward trend. That trend was broken during the Great Recession when both mean and median duration levels spiked to their highest levels in the post-WWII era (Valletta & Kuang, 2012).

Long-term unemployment, defined by the Bureau of Labor Statistics (BLS) as being unemployed for more than 26 weeks, became a serious problem during the Great Recession and is still a problem today. Figure 2 shows that the number of individuals who have been unemployed for more than 26 weeks has become a greater portion of the total unemployed population and those proportions have held steady post-recession. As of February 2014, nearly 3.9 million Americans have been unemployed for more than 26 weeks, representing 37 percent of the total number of

unemployed individuals (BLS, 2014a). For more recent data on unemployment duration from the BLS see Tables 3 and 4.

The negative ramifications of unemployment are only exacerbated as unemployment duration increases. Although there are many causes of unemployment duration, the weak/inefficient labor market, costs to employers, the income effect and moral hazard will be discussed here, with the latter being the main focus of the paper.

3.1 Moral Hazard

Insurance, of any kind, changes the probability or size of perceived loss. Moral hazard is the idea that individuals will take on greater risk when the cost of that risk is either reduced or borne entirely by a separate party, often insurance providers. Otherwise, individuals would not engage in "risky" behavior if they did not have access to insurance because the personal costs would be too large. A key to moral hazard is that providers of insurance do not have perfect information on individuals and cannot directly observe the effort the recipient expends to minimize his or her own risk.

When an individual loses his or her job, in the absence of UI, the primary source of income for that individual is gone. This increases financial risk, and if that individual does not receive UI, he or she bears the entire cost of the risk. In this case, the unemployed individual will try to return to work as quickly as he or she can in order to begin generating income again and lower his or her financial risk.

The scenario changes for unemployed workers who receive UI. Unemployment benefits lower the cost of losing a job, as the cost of the financial risk of becoming unemployed is no longer solely paid by the unemployed individual. There is now less risk to becoming unemployed since part of the cost of becoming unemployed is now paid by another party: an incentive is created for unemployed workers to delay returning to work.

Moral hazard is often thought of as "taking advantage of the system" by collecting benefits when a person could return to work. Therefore, it could be viewed by some individuals as getting paid not to work. However, these views are not shared by all UI recipients. For many, UI is a safety net that provides the time and security to search for the "right" job. Yet, they are not cognizant of the possibility that by taking the time to find the "right" job they are possibly 'taking advantage' of extended unemployment benefits.

In addition to reducing job search effort, the extension of UI can also provide an incentive to continue searching for employment for individuals whose benefits were close to expiration. Those individual, instead of running out of benefits and being forced to either return to work or leave the labor force, can now continue to receive UI benefits and search for jobs. (Rothstein, 2011). However, Rothstein (2011) also points out that extending UI can also have the negative effect of increasing unemployment by encouraging discouraged workers to re-enter the labor force (and be counted among the unemployed) to collect benefits.

If the potential for moral hazard is inherent to any insurance program, then extending that program can increase the potential for greater moral hazard. Moral hazard can become a

significant problem for social programs by making them inefficient through increased participation by individuals who do not necessarily need the support. In the case of UI, moral hazard not only raises the costs of the program through increasing benefits, but it can also create an incentive for people to not work.

3.2 The Income Effect

While moral hazard from increases in UI benefits has traditionally been accepted by many researchers as a cause for unemployment duration increases, it is not the only explanation. Chetty (2005) argues that increases in unemployment duration are the result of both an income effect and a substitution effect (moral hazard). Chetty presents his interpretation of the moral hazard effect as follows: providing UI benefits lowers the price of leisure relative to the price of working, which will result in an individual "consuming" more leisure time, because leisure is now cheaper. The cost of not working (lost wages) is not as high because of the UI benefits, and will result in individuals working less. Unemployed individuals are substituting work for more leisure, resulting in moral hazard and increased unemployment duration.

Chetty argues that unemployment duration is impacted by an income effect, stemming from consumer liquidity levels, in addition to a substitution effect (moral hazard). The impact of the income effect, according to Chetty, can be much larger than the effect of moral hazard. In order to consume goods individuals need to have cash on hand; if they are unemployed they have less income and less liquidity. UI benefits provide unemployed individuals with income which allows them to continue to raise their consumption while not working. Receiving UI benefits reduces the urgency for unemployed individuals to find work because they are not facing a financial crisis. When unemployed individuals are not motivated to quickly find work their unemployment

duration will increase. The effect of receiving income from UI, compared to not receiving it, results in an increase of unemployment duration. Details on Chetty's findings will be discussed in section 4.

3.3 Weak Job Market

The largest cause of increases in unemployment duration is a weak job market (Valletta & Kuang, 2012). During recessionary times, as the economy contracts, companies will hire fewer workers due to slowdowns in consumer consumption which result in lower levels of production. With fewer goods and services to produce, firms will reduce staff to save costs. Until consumption starts to increase, firms have no reason to hire back workers. As the demand for labor continues to remain low, there will be many individuals chasing few jobs. Low numbers of job openings will result in unemployed workers remaining unemployed longer because there are not enough available jobs. A weak job market differs from moral hazard because individuals do not have a choice of whether to continue to collect UI or return to work. When there are no job openings, people cannot get a job whether they are susceptible to moral hazard or not.

A contributing factor to both unemployment duration and the weaker job market is firms increasing their production efficiency. Due to the length and severity of the recession firms realized they couldn't just "make do" like in previous recessions; structural changes were needed in order to meet demand with reduced staff. As a result firms found ways to become more efficient and produce more output with fewer resources, specifically labor (Thurm, 2012). Firm efficiency improved so much that when the economy improved and consumer consumption rose, firms found that, because of their improved efficiency, they did not need to hire back as many workers. With firms hiring back fewer workers, many individuals remained unemployed.

3.4 Skills Mismatch/Inefficient Labor Market

During the Great Recession many individuals were competing for a small number of jobs. Many of those out of work found themselves not only competing with each other but against the rising qualification standards of employers. While unemployed, many individuals lost some of their job skills (through lack of use) or their skills became obsolete as technology passed them by. The longer individuals are unemployed the greater the problem of lost/obsolete skills becomes. There were numerous accounts of firms that could not find qualified workers to meet their needs, especially at positions that require higher skill levels (Sullivan, 2013).

During an economic boom there is low unemployment and a high number of job openings, while during a recession there is high unemployment and few job openings. The Beveridge curve depicts this relationship between the unemployment rate and the job vacancy rate. Typically, when the labor market is operating normally, the relationship between unemployment and job openings is stable and follows a specific curve (see Figure 3). During the Great Recession this relationship began to diverge when the number of job openings began to increase much faster than the unemployment rate decreased resulting in an outward shift of the Beveridge curve. The break from the normal shape of the Beveridge curve indicates an inefficient labor market where workers are not properly being matched up with open jobs.

The main culprit is believed to be a mismatch of skills. Hobijn and Sahin (2013) examine the collapse of the housing market in the United States and found a disproportionately large number of construction workers became unemployed. These construction workers may not have the job

skills required to get service sector jobs so they remain unemployed because there is no work for them in the construction sector. Another study (Ghayad & Dickens, 2013) separated the Beveridge curve into different levels of unemployment duration and found that the anomaly was caused by individuals unemployed for 26 weeks or more. This would indicate that either the long-term unemployed do lose skills over time or that employers might have less of a desire to hire individuals who have been unemployed a long time due to a stigma on the long-term unemployed.

3.5 Higher Employer Costs

Hagedorn et al (2013a) propose an alternate theory that examines unemployment duration and UI from the perspective of the firm. The UI payroll tax is a cost to employers and any changes to UI will affect the amount of tax employers must pay. EUC may increase labor costs, through the payroll tax, to employers which lowers a firm's profits. Since the payroll tax burden of the employer is partially determined by the number of workers he or she employs, the presence of EUC lowers the likelihood of a firm hiring additional workers as firms try to save money. As explained above, fewer job openings results in individuals remaining unemployed longer.

There are several theories behind the rise in unemployment duration. In this paper I hope to provide a formal argument that moral hazard, resulting from extending UI benefits, increases unemployment duration. The issue of moral hazard is not only important in the case of UI, but a potential issue for any public social program (and even some private insurance programs). If this research finds a significant moral hazard problem in UI then all other public social programs could potentially be at risk as well. Section 9 will provide some discussion on how policy makers might view the issue of moral hazard as it relates to UI based on the findings of the paper.

4 Literature Review

There is a large body of literature that has examined changes in unemployment levels, duration of unemployment, and the impacts of UI benefits. These studies try to explain changes in unemployment and duration, and any role UI has had in those changes. Primarily the findings have shown that UI increases both the level and duration of unemployment. This section will examine some of the literature that has sought to further explain some of the nuances between the interaction of UI and unemployment duration.

4.1 Increases in Job-Search Time

The main body of literature on unemployment duration has been driven by the early work of Katz and Meyer (1990) and Card and Levine (2000). These authors used hazard models to estimate the impact of UI benefit extensions on individuals' job search time. A hazard model uses a vector of factors to estimate how long an individual will remain in the UI program. The theory states that individuals will delay their job search or extend their search if they are receiving UI or UI benefits are extended.

The studies found that extending UI benefits resulted in longer job search times. They found that UI creates a disincentive for individuals to look for a job until their benefits were about to be exhausted and extending benefits only exacerbated this effect. The increase in job search time results in an increase in unemployment duration as individuals are not quickly returning to work because they are taking more time to find a job.

Although job search time was found to increase as UI benefits were extended, the authors found the effect to be modest. Estimated duration increases ranged from about 1 to 2.5 weeks based on a 13 week benefit increase. It should be noted that Katz and Meyer (1990) examined data from recessionary times, as is the case with most of the literature, while Card and Levine (2000) were able to take advantage of a natural experiment which was the result of a policy tradeoff in New Jersey during the mid-1990s. A period of economic growth meant they did not have to control for the effects of a weak labor market.[2] Card and Levine found slightly smaller increases in unemployment duration from UI benefit extensions compared with studies during recessionary times. This could mean that despite previous authors' best attempts to control for labor market conditions, some of the effects of the recession might have spilled over into the effect of extending UI, biasing the impact upwards.

These seminal papers used state administrative data to estimate their results. Administrative data provides detailed information about all individuals who received UI. An important aspect of the data is that the authors were able to track individuals over time, through receipt of UI payments, so they knew when individuals left the program. This gave authors the complete duration spell of an individual. A limitation of state administrative data is a smaller sample size. Also, only those unemployed individuals in the UI program were examined; the studies could say nothing about the unemployment duration of those who did not receive UI. To overcome this deficiency, Rothstein (2011) used data from the CPS[3] to estimate his job search hazard model. Rothstein found that job search effort increased near the point of benefit exhaustion, so extending benefits

[2] Separating out the effect of a poor labor market conditions is a common difficulty in the literature.
[3] The CPS provides a larger sample as well as unemployed individuals who receive UI and those who do not.

would delay the increase in job search effort. Like previous studies, the effect of extending benefits on unemployment duration was small.

4.2 Increased Unemployment Levels

While the impacts of UI are often examined on a 'micro' level by looking at individual unemployment durations, some research has been done to examine the effects of UI on a 'macro' level by looking the national unemployment rate. Hagedorn et al (2013a), using equilibrium job search models, estimated that extending UI benefits has a large, significant effect on the number of people unemployed and that EUC accounted for the majority of the sustained high unemployment during the Great Recession. The authors estimated that a 1% increase in the length of UI benefits for one quarter increased the unemployment rate by 0.06 log points. The average amount of UI available was 82.5 weeks for a period of 16 consecutive quarters in the Great Recession. The authors' estimates predict that during those 16 quarters the unemployment rate rose from 5% to 8.6% because of the UI extension.

Farber and Valletta (2013), in addition to looking at impacts on duration[4], estimate that the UI benefit extension during the Great Recession resulted in the unemployment rate increasing by about 0.4 percentage points. This is a small effect, relative to the high unemployment rate during the Great Recession and relative to the estimate[5] by Hagedorn et al (2013a).

Absar et al (2013) examined the impact of extending UI benefits during the Great Recession on state unemployment rates. The authors estimated that for every additional week of extended UI

[4] Farber and Valletta (2013) estimated a 7% increase in expected unemployment duration resulting from the UI benefit extensions from 2009-2011.

[5] The large difference in estimates could be due to the use of different datasets. Farber and Valletta (2013) used CPS data while Hagedorn et al (2013a) used JOLTS and Local Area Unemployment Statistics (LAUS) from the BLS.

benefits in the prior quarter the state unemployment rate increased by about 0.025 percentage points.

4.3 Differences across Demographics

Another question that has been asked by several researchers is whether UI benefit increases affect different groups differently. Winter-Ebmer (2001) and Schmieder et al (2012) examined the impacts of extending UI on different age groups in Europe. In Austria, a policy change resulted in select areas of the country receiving UI benefit extensions. Using a difference-in-difference technique, Winter-Ebmer (2001) found that extending benefits not only increased unemployment duration but resulted in an increase in entry to unemployment as well. Older workers were found to have especially high rates of entry into unemployment resulting from the benefit extension. Unemployment rates rose high enough that the law increasing benefits was abolished.

In Germany, unemployed persons are eligible for different lengths of UI benefits depending on their age, with older workers being eligible for longer benefits compared with younger workers. Schmieder et al (2012) used regression discontinuity to find that after individuals reach the eligible age the benefit increase creates a small disincentive to work.

Aaronson et al (2010) used a Blinder-Oaxaca Decomposition to examine how much of the increases in unemployment duration resulted from changing labor force demographics in the United States. The authors found that demographic factors account for a significant portion of the increase in unemployment duration over time, however those factors only account for a portion of the dramatic increases seen in the most recent recession. The demographic factors

examined by Aaronson et al were age, gender, marital status, race, education, industry and occupation. Although the authors found that most of the individual changes in these factors had little effect, age was a notable exception. Younger workers (less than 24 years old) tend to have shorter duration spells than older workers because they frequently enter and exit the labor force. Over time there has been a large decrease in the young workers' share of the labor force, and with fewer shorter duration spells the average duration level will rise. Another notable cause of increased unemployment duration is the rise of women's duration spells, which account for nearly all of the increase in duration from the mid-1980s to the mid-2000s. This is due to greater numbers of women entering the labor force over that period.

4.4 Differences in Income

Following Chetty's (2005) income effect theory, described in section 3.2, he compares duration spells of groups with different incomes. He found that constrained households or those with low liquid wealth are affected by increases in UI benefits more than unconstrained households or those with higher liquid wealth. Using hazard models, Chetty's estimates revealed two key findings. First, that UI benefits cause large increases in unemployment duration for constrained households or those with low liquidity. Second that UI benefits cause small substitution effects (moral hazard) on unconstrained households or those with higher levels of liquidity. To separate out the income and substitution effects Chetty took advantage of lump sum severance payments to unemployed individuals. There were large impacts on duration from the severance payments on the constrained households and no impact on unconstrained households. With severance payments being a one-time event there is little opportunity to substitute one activity for another but there is opportunity to change spending behavior; this represents the income effect. An individual from a low-liquidity household can take a lump sum payment and spend it on basic

goods, which can lengthen unemployment duration because that individual's basic needs are met for a period of time. Chetty assumes that if the substitution effect or moral hazard for both groups is of similar size then the income effect on constrained households is very large. This is a major assumption that Chetty acknowledges needs further examination.

Exploring the same issue, Corsini (2013) provides evidence on the impact of extending UI benefits on unemployment duration from Italy. Corsini also uses hazard models to find that unemployment benefits do not increase the duration spells of wealthier households. Duration was shown to largely decrease when the lost job was a major source of income to the household, but providing UI benefits to offset the loss of that income will increase duration spells. Corsini argues that this finding indicates that the amount of lost household consumption is a very important factor in determining an unemployed individual's search effort for work, and thus his or her duration spell. Both Chetty and Corsini argue that constraints of liquidity have a major effect on unemployment duration. Those who benefit the most from receiving UI are the ones who are most impacted by it.

4.5 North Carolina Policy Experiment

An interesting policy development is taking place in North Carolina, where UI benefits were reduced. Starting in July of last year a law was passed that made North Carolina residents ineligible for federal UI benefit extensions, leaving unemployed individuals only able to receive the standard benefits. Hagedorn et al (2013b) have examined preliminary employment data from North Carolina since the policy change and found that unemployment has fallen and employment levels have risen. The authors examined three different data sets and found similar results across all three. They also compared the data of nearby states and found that employment growth in

North Carolina is increasing faster than neighboring states. Hagedorn et al (2013b) state that these are only preliminary findings from a single state and readers should exercise caution when drawing conclusions about the results of the initial data. As more data comes in it will be interesting to see if the positive employment shifts continue and what effects this may have on future unemployment policy.

The objective of this paper is to further expand on the literature by including data from after the Great Recession up to 2013. The study will make use of the variation in EUC eligibility across states. This paper takes into account the changes in EUC, both extension lengths and eligibility changes, over the entire period the program was active (see Table 2).

5 Methodology

This section discusses the methods used to answer two questions about how much of the dramatic increase in unemployment duration can be attributed to the extension of UI benefits during the Great Recession. The first question examined is how much of the increase in unemployment duration can be attributed to the extension of UI benefits? I hypothesize that a small but statistically significant portion of the increase in unemployment duration can be attributed to the extension of UI benefits.

The ideal method of finding the true impact that extending benefits had on unemployment duration is to take the difference of an individual's actual outcome from the individual's counterfactual outcome. An unemployed individual's actual outcome is the duration spell he or she experienced while receiving extended UI. The counterfactual outcome is that same individual's duration spell if he or she had not received extended UI. This ideal scenario is not

possible because a person cannot be observed as being in two different states of the world at once (cannot both receive extended UI and not receive extended UI over the same time period). Instead it would be necessary to find a "comparison" group of unemployed individuals who receive only regular UI benefits (26 weeks) whose unemployment durations can be compared to the durations of the "treatment" group of unemployed individuals who receive the extended UI benefits over the same period. The difference in unemployment durations of the two groups is the impact of extending UI benefits.

Unfortunately, the benefit extension was a nation-wide program that affected all unemployed individuals so data for the above "comparison" group does not exist. Instead the analysis will take advantage of the different eligibility requirements across the separate tiers of EUC that create variation across states in the maximum number of weeks of UI individuals can receive (see Table 2). Eligibility for certain tiers of EUC is dependent on a state reaching certain unemployment thresholds (see Table 1). Because of the variation across individual state unemployment rates (see Figure 4); individuals from one state could be eligible for more weeks of UI than individuals from another state. Differences in state economies result in large variations in unemployment rates between states that would affect the level of EUC benefits residents are eligible for. Residents in states with higher, sustained unemployment rates when EUC was in effect would have been eligible for more weeks of UI for a longer period of time compared with states with lower unemployment rates over that same time period. This variation across states in the maximum number of weeks of UI allows for the estimation of the impact of UI benefit extension on unemployment duration (see Table 1).

5.1 OLS Regression

To determine how much of the increase in unemployment duration can be attributed to the UI benefit extension the analysis will begin with a basic OLS regression model. Panel CPS data[6] will be used to examine how individual unemployment durations vary with the weeks of UI eligibility between states going back to 2003.[7] To estimate the difference, a standard OLS regression model will regress the maximum number of weeks of UI an individual is eligible for on unemployment duration, controlling for individual characteristics as well as labor market conditions. The model will be specified as follows:

$$UD = \beta_0 + \beta_1 X + \delta MaxUI + \beta_2 L + \epsilon \qquad (1)$$

where UD is the unemployment duration, measured in number of weeks, and X is a vector of individual characteristics such as age, gender and education (see Table 5 for full list of controls). *MaxUI* is the maximum number of weeks of UI an individual is eligible to receive, and L represents economic factors that would influence unemployment duration including unemployment rates.

The key variable of interest, *MaxUI*, estimates how much an individual's unemployment duration is impacted by the maximum weeks of UI that person is eligible to receive. The coefficient of *MaxUI* can be interpreted as the 'the effect each additional week of maximum UI duration on unemployment duration' while holding the effects of other factors constant. As the maximum duration of UI increases it is expected that unemployment duration will increase as

[6] The CPS is not a true panel dataset; see section 7 for further discussion.
[7] Data on EUC and EB active triggers for states could only be collected going back to 2003. As a result the regression results will only have observations from 2003-2013.

well. The addition of other economic and individual characteristics in the model helps control for the impact of the recession to isolate the effect of *MaxUI*.

The impacts of the controls such as age, gender, race, education and income, on duration spells could also be of interest. Aaronson et al (2010) estimated that demographics account for a large portion of unemployment duration; however only a portion of the recent increase in duration can be attributed to changing demographic factors. Adding these controls is important to avoid omitted variable bias since previous research has shown that demographics of the workforce play a big role in determining unemployment duration.

Controlling for the labor market (through national and state unemployment rates as well as the number of national job openings) is critical as previous research has shown that labor market conditions are one of the major factors that determine unemployment and duration levels. Valletta and Kuang (2012) estimated that for a 12 month period ending in August 2011 nearly half (about 7.5 weeks) of the 15 week increase in unemployment duration during that time is the result of the persistence of employment losses from the recession.

One limitation of using a basic OLS model is the inability to control for potential underlying trends affecting the data. These trends could be either occurring over time (a systemic or cyclical change in the labor market) or resulting from differences across states outside of the differences in UI eligibility. By not properly accounting for these trends the results could be biased from omitting important and relevant variables. Adding fixed effects for state and year to the model will help to control for those trends.

5.2 Fixed Effects

The effect of the benefit extension would not have the same impact over time or across different states. So it does not make sense to estimate a single, one time national impact of the benefit increase. Using both state and year fixed effects will control for these trends and strengthen the explanatory power of equation (1). The inclusion of the fixed effects also removes omitted variable bias from the estimates.

Important factors to consider are variables that do not change over time. This is best seen in differences across states. State economies can vary widely; a dominant sector in one may have little influence in another, leading to differences in workforces and unemployment patterns. There are differences in UI eligibility requirements between states that might not be completely controlled for by the *MaxUI* variable. There are also differences in other social programs that can have an effect on how long individuals remain unemployed, or if they participate in UI. States can vary greatly so it will be important to account for those differences by adding state fixed effects.[8] Adding fixed effects to the model does lower the degrees of freedom, but this is a limitation that is easily overcome with the use of large samples. When only the state fixed effects are added to equation (1) the model is specified as follows:

$$UD = \beta_0 + \beta_1 X + \delta MaxUI + \beta_2 L + \alpha_i + \nu_{it} \qquad (2)$$

where α_i represents state fixed effects and is the time invariant component of the error term and ν_{it} is the error term.

[8] Similar to year fixed effects, a dummy variable indicating which state an individual is from will need to be added to the model. All states except one receive a dummy indicator. This is done avoid issues of perfect collinearity. The state not included will act as a baseline to which all other states are compared.

Unemployment duration might follow a particular pattern over time or a specific year(s) might have an effect on unemployment duration relative to other years. Year fixed effects will capture the variation in unemployment duration year over year.[9] It would be important to control for individual years because there might be events happening across multiple states in particular years that are not being picked up by either the controls or state fixed effects. When year fixed effects are added to equation (2) the model is specified as follows:

$$UD = \beta_0 + \beta_1 X + \delta MaxUI + \beta_2 L + \alpha_i + \eta_t + \nu_{it} \quad (3)$$

where η_t represents the year fixed effects and is the common observed time trend and ν_{it} is the error term containing time varying unobserved characteristics.

MaxUI is the key variable of interest and will estimate how much an individual's unemployment duration is impacted by the number of weeks of UI that person is eligible to receive. As the maximum number of weeks of UI increases it is expected that unemployment duration will increase as well. The addition of other economic and individual characteristics will help control for the impact of the recession as well as any individual level variation, in order to isolate the effect of *MaxUI*.

Fixed effects also allow for comparisons between different states or across different years. The EUC benefit extension might have affected the unemployment duration differently depending on the state; one state might have seen a greater rise in unemployment duration resulting from the benefit increase compared to another state. Impacts could also be compared across years to see if

[9] To add year fixed effects a dummy variable which stands for an indicator for each year (except one) can be added to the model. One year (generally the first in the sample) is not added to avoid perfect collinearity in the model and act as the baseline to which all other years are compared.

the impact of the benefit increase on unemployment duration was greater in one particular year over another.

The second question asks whether extensions in UI benefits have a larger impact on the long-term unemployed. I hypothesize that the impact of extending benefits has a significant impact on the long-term unemployed and that the effect would be greater compared to the entire unemployed population.

To answer this question the analysis will employ the same models described above but instead of using the duration spells of all unemployed individuals the sample will be restricted to only those who have durations greater than 26 weeks. The controls in the models remain the same but the dependent variable now becomes long-term unemployment duration which is measured in weeks like the previous models but has a smaller range (see Table 5 for summary statistics). The key variable of interest, *MaxUI*, will now estimate how much the duration spell an individual who is long-term unemployed will be impacted by extending UI benefits. It is expected that *MaxUI* will be positive and larger in magnitude than the results of the previous models.

6 Data

All of the data used in this paper comes from the Bureau of Labor Statistics (BLS). A part of the US Department of Labor, the BLS works to provide timely, accurate information on the United States economy and labor market activity.

The primary dataset is a sample from the Current Population Survey (CPS), a monthly survey of 60,000 households (King et al, 2010). The survey provides comprehensive information on the

employment and unemployment experience of the United States population (BLS, 2014b). The purpose of the CPS is to gain a sense of the nation's working experience as well as information about income. Demographic and economic characteristics about each individual and their household are also collected.

The specific sample utilized for analysis from the CPS is the Annual Social and Economic Supplement (ASEC). This supplement survey is conducted every March and expands on the regular CPS by asking more detailed questions on social and economic characteristics and the work experience of each individual. This version of the CPS is used because of the additional unemployment information available including: how many continuous weeks that individual has been unemployed. For this research, data was collected from the ASEC conducted every March since 1977. Only individuals who are classified as either unemployed or not in the labor force were included in the sample.

The three models described above will be each estimated twice using two different dependent variables, both of which measure unemployment duration. The first dependent variable includes duration spells from the entire sample and the second dependent variable includes only those duration spells of individuals who are long-term unemployed. This is done to see if extending benefits has an impact on the long-term unemployed that is different from the entire unemployed population.

The full duration spell sample includes only individuals who are unemployed or out of the labor force at the time of their survey response, from 2003-2013. All unemployment durations are included in the full duration sample to capture the impact on the total unemployed population. The long-term duration sample also includes only individuals who are unemployed or out of the labor force and have duration spells are greater than 26 weeks.

To estimate the impact of UI benefit increases on duration, a variable was created that shows the maximum number of weeks of UI benefits an individual is eligible to receive, dependent on the unemployment rate of that individual's state. This variable, *MaxUI*, includes all possible benefits from each program: standard UI benefits (26 weeks), EB (max of 20 weeks), and EUC (max 53 weeks).

MaxUI accounts for the changes in EUC (see Table 2) as well as the changing state eligibility for either program based on unemployment rates (see Figure 4). Information on when EB and EUC were triggered for each state going back to 2003 was collected from the BLS (see Table 1). The variation in *MaxUI* across states can be seen in Figure 5.

In order to accurately analyze the effect of moral hazard on unemployment duration other factors that have an impact on duration will have to be controlled for. The following are several variables that were collected to control for other impacts. These controls are macro variables, rather than at the individual micro level of the CPS, and are matched to individual records in the CPS data by year and state.

The strength or weakness of the labor market is one of the biggest factors in determining unemployment duration (Aaronson et al 2010; Valletta and Kuang 2012). In order to isolate the impact of extending UI benefits on duration spells, this paper will utilize three measures to control for the condition of the nation's labor market. The first will be the national unemployment rate, which is estimated on a monthly basis by the BLS.

Individual state unemployment rates are collected as a part of Local Area Unemployment Statistics (LAUS), a joint effort by states and the federal government to estimate employment levels for each state as well as metropolitan areas, counties and cities with populations larger than 25,000. Monthly unemployment rates were collected for each state (and the District of Columbia) going back to 1977. Economies can vary widely from state to state, so having individual state unemployment information will provide a much clearer picture of the condition of the labor market than just national level data.

In 2000, the Job Openings and Labor Turnover Survey (JOLTS) was created by the BLS to measure national labor demand. Approximately 16,000 businesses, across all nonagricultural industries and in both the private and public sectors, are surveyed and data is released each month. The data collected from the JOLTS survey can be a good measure of the tightness of the national labor market, and it provides a more accurate picture of the national labor landscape from the demand (employer's) side. Multiple measures are calculated from the JOLTS data (see Table 6) but this analysis will use the number of job openings in the nation. Unfortunately JOLTS is not separated out by state, so this variable can only proxy as a control for the national labor market and will not be able to pick up any variation between states. The job openings value

can be used alongside the unemployment rate, to provide a more complete picture of the supply side of the nation's labor market.

7 Limitations

One major limitation of using the CPS dataset is the inability to track the same individuals over time because of partial participant turnover each month (Census Bureau, 2013). Since individuals cannot be tracked the full length of an individuals' unemployment duration spell cannot be measured, since the survey only captures the length of the spell at one point in time. The CPS will only provide data on unemployment duration if the individual is in the midst of a spell; there is no information on when the spell ended or how long it continued after the survey. Not knowing the full length of the spell will result in some downward bias in the measurement of unemployment duration, although the size of the bias is unclear. The full duration models assume that extending benefits might influence the length of an unemployment spell for all durations. The model would capture the impact of extending benefits along the entire distribution of spells, but with incomplete duration data the estimated impact would not be accurate.

There is further bias introduced to unemployment duration because the survey is skewed toward longer spells of duration; this effect was examined for poverty spells by Bane and Ellwood (1983). For a survey taken at a particular point in time individuals who have longer spells of unemployment duration are more likely to appear in the survey compared with individuals with shorter spells. This results in some upward bias, although the size of the bias is also unclear. The models with long-term duration as the dependent variable would avoid some of this bias because the sample examined only includes those with longer spells. Upward bias would not be as large for the long-term duration models because there are fewer shorter spells being estimated.

Another limitation is the lack of data on participation history in the UI program, whether the respondent is currently receiving benefits or if they have previously exhausted all benefits available to them. To account for this an indicator if an individual has reported receiving income from UI in the last year will be used as a proxy for participation in the UI program.

A final limitation comes with the difficulty in separating out the effect of the Great Recession from the effect of the benefit increase, especially since the downturn in the economy resulted in the EUC extension. Instead of simply using an indicator that was equal to one when the benefit increase occurred, which would too closely align with the recession, this analysis takes advantage of the variation across states in how many weeks of the extension were available to the unemployed. Unfortunately the variation across states is partially due to changes in the economy, so there will be some influence from the poor labor market within *MaxUI*. The effect of the Great Recession could not be fully controlled for so the following results may not reveal the true impact of the benefit increase.

8 Results

This section reports the results of the models discussed above. The models using full duration spells are presented in Table 7 and the results of the long-term unemployed models are presented in Table 8.

8.1 OLS Model Results for All Duration Spells

The results in column one of Table 7 show that *MaxUI* is statistically significant and positive; indicating that as the maximum UI eligibility duration goes up, on average a person's spell of unemployment duration also increases, holding all other factors constant. On average, for each

additional week of extended UI benefits, an individual's unemployment duration increased by 0.16 weeks, holding all other factors constant. Based on the increase in the average maximum weeks of UI benefits (about 65 weeks) as a result of the benefit extension, duration spells increased by about 10.52 weeks.

Both the state and national unemployment rates have significant impacts on duration of unemployment spells, which was expected with these variables acting as a proxy for the condition of the labor market. One of the largest impacts on unemployment duration was race. The race indicators were all statistically significant and had relatively large impacts compared to *MaxUI*[10]. On average a black individual's unemployment duration is 5.5 weeks longer compared to the unemployment duration of a white individual, holding all other factors constant; this was the largest effect from a particular race on duration spells. Females, on average, had shorter unemployment durations than men by about 1.5 weeks, a statistically significant difference. Total family income had a negative impact on duration spells, although it is a small impact. For every one thousand dollars a family earns, the unemployed family member's duration spell decreases by 0.05 weeks, holding other factors constant. The direction of this effect makes sense: as family members earn more income they would be able to provide for an unemployed family member such that he or she would not need to receive UI.

8.11 OLS Model Results for Long-term Unemployed

The results in column one of Table 8 reveal a positive, significant estimate for *MaxUI* on the long-term unemployed, indicating that as the maximum UI eligibility duration goes up, a long-term unemployed person's spell of unemployment duration also increases. On average, for each additional week of extended UI benefits, a long-term unemployed individual's duration spell

[10] White is the reference category for race.

increased by 0.17 weeks, holding all other factors constant. Based on the increase in the average maximum weeks of UI benefits (about 65 weeks) as a result of the benefit extension, duration spells of the long-term unemployed increased by about 11.17 weeks. As expected the impact of *MaxUI* on the long-term unemployed is slightly greater than the impact on all duration spells from the OLS model in column one of Table 7.

When examining the controls for the long-term unemployed model, there are some notable differences from the results of the full duration model. The impact of state unemployment rates on long-term duration spells decreased by more than half while the effect of the national unemployment rate became insignificant. The effect of being black compared to white decreased notably while remaining significant. Hawaiian/Pacific Islander was the only race indicator that was insignificant. Both indicators for education, having at least a high school diploma and having at least a Bachelor's degree as well as the indicator for being married were insignificant while they were significant in the full duration model. These factors might be insignificant now because they might not be as predictive of duration spells for the long-term unemployed, who are a more disadvantaged group. T here might be alternative factors that determine the duration of the long-term unemployed that are not controlled for in the model, such as lost skills, mental illness, functional impairments, etc.

8.2 State Fixed Effects Model Results for All Duration Spells

After adding state fixed effects, the results in column two of Table 7 show that *MaxUI* is statistically significant and positive. On average, for each additional week of extended UI benefits, an individual's unemployment duration increases by 0.17 weeks, holding all other factors constant. Based on the increase in the average maximum weeks of UI benefits (about 65

weeks) as a result of the benefit extension, duration spells increased by about 11.17 weeks. This effect is slightly larger than the OLS result.

The results from adding state fixed effects are similar to the OLS model results for all duration spells. One difference was national unemployment rate, which became insignificant when state fixed effects were added. The insignificant effect could be the result of national job openings capturing the effect of the national labor market or state level labor markets have more influence on duration spells compared to the national level. Another difference was the drop in magnitude of the effect of living in a metro area. In the OLS model, residing in a metro area increased duration spells by 1.36 weeks over residing in a rural area, but when state fixed effects were added that impact fell to 0.65 weeks. This effect could be the result of industries that were hit especially hard during the recession being primarily located in metropolitan areas. The indicator for being married slightly decreased from the OLS full duration model. The duration spell of an individual who is married is, on average, 1.4 weeks fewer than the duration spell of a single individual, holding other factors constant. Unemployed individuals with spouses, who presumably are employed, could be supported by their spouse.

8.21 State Fixed Effects Model Results for Long-term Unemployed

After adding state fixed effects, the results in column two of Table 8 reveal a positive, significant estimate for *MaxUI* on the long-term unemployed. On average, for each additional week of extended UI benefits, a long-term unemployed individual's duration spell increases by 0.18 weeks, holding all other factors constant. Based on the increase in the average maximum weeks of UI benefits (about 65 weeks) as a result of the benefit extension, duration spells of the long-

term unemployed increased by about 11.83 weeks. As expected the impact on the long-term unemployed is greater than, but only slightly, the impact on all durations from the OLS model in column two of Table 7.

The state fixed effects long-term duration model produced very similar results for the controls at the OLS long-term duration model. The effect of age, which decreased only slightly, was positive and significant. Age's impact on duration spells is larger than the impact of the benefit increase. For each additional year of age, there is an increase in unemployment duration of .25 weeks, holding other factors constant. This result supports previous findings that older individuals have longer unemployment duration spells compared to younger workers (Aaronson et al, 2010).

8.3 State and Year Fixed Effects Model Results for All Duration Spells

When including both state and year fixed effects, the results in column three of Table 7 reveal that *MaxUI* is statistically significant and positive. On average, for each additional week of extended UI benefits, an individual's unemployment duration increases by 0.08 weeks, holding all other factors constant. Based on the increase in the average maximum weeks of UI benefits (about 65 weeks) as a result of the benefit extension, duration spells increased by about 5.26 weeks. This effect is much smaller than the OLS and state fixed effects models, less than half of the other estimates impacts. A smaller effect after controlling for variation across years could indicate the benefit extension had greater impact in some years more than others. Those differences are no longer being captured in *MaxUI*, rather being captured by the year fixed effects. Year fixed effects can also account for some of the variation in *MaxUI* over time.

For the most part the impacts of the controls after adding both state and year fixed effects are smaller compared to the model with only state fixed effects, when examining full duration spells. One relatively sizeable increase was on state unemployment rates. For every percentage point increase in a state's unemployment rate there is an increase of 1.3 weeks in an individual's unemployment duration, holding other factors constant. The effect of living in a metro area also increased, while the effect of being female became a larger negative impact, meaning that women have shorter duration spells compared to men.

8.31 State and Year Fixed Effects Model Results for Long-term Unemployed

The results in column three of Table 8, after adding both state and year fixed effects, reveal a positive, significant estimate for *MaxUI* on the long-term unemployed. On average, for each additional week of extended UI benefits, a long-term unemployed individual's duration spell increases by 0.16 weeks, holding all other factors constant. Based on the increase in the average maximum weeks of UI benefits (about 65 weeks) as a result of the benefit extension, duration spells of the long-term unemployed increased by about 10.52 weeks. This result is noticeably larger than the estimate for all durations of 0.08, when state and year fixed effects are added which was expected. The result was hypothesized to be larger for the long-term unemployed because the long-term unemployed are more susceptible to changes in UI benefits compared to the entire unemployed population.

The impacts of the controls for the state and year fixed effects long-term duration model are very similar to the estimates from the state fixed effects long-term model. National job openings, total family income, age, race and gender remain significant indicators of unemployment duration. The only race indicator that is not significant is Hawaiian/Pacific Islander. It is interesting to note that while black had the largest impact in all of the full duration models; it had one of the smaller

impacts among the race indicators for the long-term unemployed. Instead, American Indian had the largest effect on the duration spells of the long-term unemployed with spells lasting about 3.3 weeks longer compared to white long-term unemployed individuals.

The fixed effects model takes a more rigorous approach than the basic OLS model by separating out the effects of the UI benefit extension across years and states. The estimates of the fixed effects model are preferred because of the ability to control for variation across years and states.

9 Conclusion

The analysis estimated a statistically significant impact of extending UI benefits on unemployment duration. This finding indicates that at least a portion of the dramatic increase in unemployment duration around the time of the Great Recession can be attributed to the federal extension of unemployment insurance benefits during that period. If the maximum duration of UI benefits increased by one week, an average individual's unemployment duration increased by 0.08 weeks, holding all other factors constant. Based on the increase in the average maximum weeks of UI benefits (about 65 weeks) as a result of the benefit extension, duration spells increased by about 5.26 weeks. In addition, the analysis also found that extending UI benefits has a greater impact on the long-term unemployed relative to the entire unemployed population. If the maximum duration of UI benefits increased by one week an average, long-term unemployed individual's duration spell increased by 0.16 weeks, holding all other factors constant. Based on the increase in the average maximum weeks of UI benefits (about 65 weeks) as a result of the benefit extension, duration spells of the long-term unemployed increased by about 10.52 weeks.

A significant finding indicates that extending UI benefits might result in a moral hazard effect and lead to increased unemployment duration spells. Policy makers need to take care when addressing issues of moral hazard in unemployment insurance because there can be positive outcomes to longer duration spells as well as negative outcomes discussed earlier. Individuals can take advantage of extended UI benefits to take additional time to find a good, higher-paying job. This not only benefits the individual but having more people in stable, well-compensated occupations has benefits for the economy.

The much larger impact on the long-term unemployed, twice as large as the impact on the entire unemployed population, raises concerns. For those already with long spells of unemployment, extending UI benefits increases unemployment duration at a greater rate relative to the entire unemployed population. This suggests a more targeted approach is needed to assist the long-term unemployed in returning to work.

There are some limitations in this research that could be influencing the findings of the analysis. One is an issue of selection with the long-term unemployed as they are more likely to "select" to remain unemployed when there are extended UI benefits available compared to short-term unemployed. The issue of selection is troublesome because the individuals who select to remain long-term unemployed might have some fundamental differences from those who choose to drop out of the labor force or who end up finding a job. The potential selection issue is not examined in this paper and those potential differences between groups are not explored. The data issues discussed earlier are another limitation that affects the estimates. The structure and format of the CPS and the lack of complete data on the same individuals over time lower the ability to estimate

the true impact of extending benefits on unemployment duration. Another issue is the heavy reliance on state variation in EUC to estimate the impact of benefit extensions on duration. The variation is the result of differences in state economic conditions the effects of which might not be completely captured by the *MaxUI* variable. Additionally, the effect of the Great Recession could not be completely controlled for because *MaxUI* incorporates differences in state economic conditions.

9.1 Policy Implications

Since EUC's expiration, policy makers have been debating whether to refund the program. Recently the U.S. Senate passed a bill that would renew EUC through May of this year and provide retroactive payments to individuals whose benefits expired at the end of last year (Kane, 2014). The bill would require greater job training for the long-term unemployed in order to continue to receive benefits and prevent unemployed individuals whose income in the previous year was greater than $1 million from receiving UI benefits. The critics of extending benefits, which would affect millions of Americans, call attention not only to the high cost of the program, expected to be about $10 billion (Kane, 2014), but cite previous literature that found extending benefits created disincentives to work and increased unemployment duration.

The findings of this paper indicate that at least a portion of the dramatic increase in unemployment duration around the time of the Great Recession can be attributed to the federal extension of unemployment insurance benefits during that time. The significant findings indicate a moral hazard problem and extending benefits creates disincentives to work. These findings could result in policy makers altering the unemployment insurance program, like the proposed changes above, in order to guard against moral hazard and prevent abuses of the program.

Despite the significant effect of extending UI benefits, the increase in unemployment duration is not necessarily all due to moral hazard. Some of the Great Recession's impact is still present in the *MaxUI* variable, possibly inflating the size of the extension's effect. Even with the uncertainty of the true size of the moral hazard effects, there is still a large problem with high unemployment duration levels (see Figure 2). Finding ways to aid unemployed individuals in returning to work will help to make the labor market more efficient and reduce the stigma against the long-term unemployed (Ghayad & Dickens, 2013).

Lawrence Katz, cited earlier for finding that extending UI benefits creates disincentives to work, now believes that extending UI benefits is the right policy because the current labor market is very different from when he conducted his research in the 1970s and 1980s (Jacobson, 2009). Katz pointed to the high number of job seekers per job opening and that disincentives to work in the 70s and 80s were an issue because jobs were less scarce. Today disincentives to work are not a problem when many individuals simply cannot find work. UI provides a valuable safety net and reducing benefits or enacting more stringent eligibility requirements would likely have far worse consequences than moral hazard.

Additional research is needed to more accurately estimate the impact of extending unemployment insurance. The variable *MaxUI* captures some differences in economic conditions between states which biases the impact of the benefit extension. Models that better control for the poor economic conditions during the Great Recession would better estimate the impact of extending UI benefits on unemployment duration. Future research on this topic should combine

past approaches and use both administrative UI data as well as data from the CPS to overcome the data issues of the CPS. Further examination of the effects of UI on the long-term unemployed should also be conducted to determine the full extent of the disparate impacts of UI on the unemployed population. Looking into the possible issue of long-term selection would provide more insight into why the long-term unemployed are remaining out of work for such long stretches.

Bibliography

Aaronson, D., Mazumder, B., & Schechter, S. (2010). What is Behind the Rise in Long-Term Unemployment? *FRB Chicago Economic Perspectives* , 28-51.

ADP. (2012). *Federal Unemployment Tax Act (FUTA) Increases for 2012 and 2013.* Automatic Data Processing, Inc.

American Payroll Association. (2014). *State Unemployment Insurance Taxable Wage Bases 2011-2014*. Retrieved from American Payroll Association: http://www.americanpayroll.org/members/stateui/state-ui-2/

American Psychological Association. (2014). *Psychological Effects of Unemployment and Underemployment*. Retrieved 1 31, 2014, from American Psychological Association: https://www.apa.org/about/gr/issues/socioeconomic/unemployment.aspx

Bachmann, R., & Sinning, M. (2012). Decomposing the Ins and Outs of Cyclical Unemployment. *IZA Discussion Paper No. 6362* .

Bane, M. J., & Ellwood, D. T. (1983). Slipping Into And Out Of Poverty: The Dynamics Of Spells. *National Bureau of Economic Reserach Working Paper No. 1199* .

BLS. (2014a). *Employment Situation Summary.* Economic News Release. Bureau of Labor Statistics.

BLS. (2014b, February 25). *Labor Force Statistics from the Current Population Survey*. Retrieved from Bureau of Labor Statistics: http://www.bls.gov/cps/cps_over.htm

BLS. (2014c, January 14). *Long-term unemployed account for 37.7 percent of all unemployed persons in December 2013*. Retrieved from The Editor's Desk: http://www.bls.gov/opub/ted/2014/ted_20140114.htm

Card, D., & Levine, P. B. (2000). Extended benefits and the duration of UI spells: Evidence from the New Jersey extended benefits program. *Journal of Public Economics* .

CBO. (2012). *The Distribution of Household Income and Federal Taxes, 2008 and 2009. Congressional Budget Office.*

Census Bureau, U. S. (2013, April 22). *Current Population Survey (CPS) Methodology*. Retrieved from United States Census Bureau: https://www.census.gov/cps/methodology/

Center on Budget and Policy Priorities. (2013, December 16). *Policy Basics: How Many Weeks of Unemployment Compensation Are Available?* Retrieved from Center on Budget and Policy Priorities: http://www.cbpp.org/cms/?fa=view&id=3164

Changes to data collected on unemployment duration. (2011, July 8). Retrieved from Bureau of Labor Statistics: http://www.bls.gov/cps/duration.htm

Chetty, R. (2005). Why Do Unemployment Benefits Raise Unemployment Durations? Moral Hazard vs. Liquidity. *NBER working paper* .

Corsini, L. (2013). How unemployment benefits affect individuals of different wealth classes: Some evidence from Italy. *International Journal of Manpower* , 693-711.

Council of Economic Advisers. (2011). *Unemployment Insurance Extensions and Reforms in the American Jobs Act.*

DOL. (2013, May 23). *State Unemployment Insurance Benefits*. Retrieved from United States Department of Labor DOL: http://workforcesecurity.doleta.gov/unemploy/uifactsheet.asp

Elmendorf, D. (2011). *Policies for Increasing Economic Growth and Employment in 2012 and 2013.* testimony before the Senate Budget Committee, Congressional Budget Office.

Farber, H. S., & Valletta, R. G. (2013). Do Extended Unemployment Benefits Lenghten Unemployment Spells? Evidence From Recent Cycles In The US Labor Market. *National Bureau of Economic Research Working Paper No. 19048* .

Federal Reserve Bank of St. Louis. (2014). *Employment Situation*. Retrieved from Economic Reserach Federal Reserve Bank of St. Louis: http://research.stlouisfed.org/fred2/release?rid=50

Ghayad, R., & Dickens, W. (2013, January 5). *It's not a skill mismatch: Disaggregate evidence on the US unemployment-vacany relationship*. Retrieved from VOXEU: http://www.voxeu.org/article/it-s-not-skill-mismatch-disaggregate-evidence-us-unemployment-vacancy-relationship

Green, J. (2013, December 12). *Congress's Big, Stingy Christmas Mistake*. Retrieved 2 1, 2014, from Bloomberg Businessweek: http://www.businessweek.com/articles/2013-12-12/if-congress-lets-unemployment-benefits-end-economy-may-suffer

Gruber, J. (1994). The Consumption Smooting Benefits of Unemployment Insurance. *National Bureau of Economic Research Working Paper Series* .

Hagedorn, M., Karahan, F., Manovskii, I., & Mitman, K. (2013a). Unemployment Benefits and Unemployment in the Great Recession: The Role of Macro Effects. *National Bueau of Economic Research Working Paper No. 19499* .

Hagedorn, M., Karahan, F., Manovskii, I., & Mitman, K. (2013b, January 15). Case Study of Unemployment Insurance Reform in North Carolina.

Hobijn, B., & Sahin, A. (2013). Beveridge Curve Shifts across Countries Since the Great Recession. *Working Paper Federal Reserve Bank of San Francisco* .

Jacobson, L. (2009, August 2). *Michelle Malkin says former Clinton offcial says extending unemployment benefits is counterproductive*. Retrieved from Tampa Bay Times Politifact: http://www.politifact.com/truth-o-meter/statements/2009/aug/04/michelle-malkin/michelle-malkin-says-former-clinton-official-says-/

Kane, P. (2014, March 13). *Senate reaches bipartisan deal on unemployment benefits extension*. Retrieved from Washington Post: http://www.washingtonpost.com/politics/senate-reaches-bipartisan-deal-on-unemployment-benefits-extension/2014/03/13/38833c1e-aad7-11e3-af5f-4c56b834c4bf_story.html

Katz, L. F., & Meyer, B. D. (1990). The Impact of the potential duration of unemployment benefits on the duration of unemployment". *Journal of Public Economics* .

King, M., Ruggles, S., Alexander, J. T., Flood, S., Schroeder, M., Schroeder, M. B., et al. (2010). Integrated Public Use Microdata Series, Current Population Survey: Version 3.0 [Machine-readable database]. (Universiy of Minnesota.) Minneapolis, Minnesota.

Rothstein, J. (2011). Unemployment Insurance and Job Search in the Great Recession. *National Bureau of Economic Research Working Paper Series* .

Schmieder, J. F., von Wachter, T. M., & Bender, S. (2012). The Long-Term Effects of Unemployment Insurance Extensions on Employment. *National Bureau of Economic Research Working Paper No. 17814* .

Stone, C., & Chen, W. (2013, February 6). *Introduction to Unemployment Insurance*. Retrieved January 28, 2014, from Center on Budget and Policy Priorities: http://www.cbpp.org/cms/index.cfm?fa=view&id=1466

Sullivan, A. (2013, August 19). *Why Jobs Go Unfilled Even in Times of High Unemployment*. Retrieved from The Atlantic: http://www.theatlantic.com/business/archive/2013/08/why-jobs-go-unfilled-even-in-times-of-high-unemployment/278801/

The Social Security Act of 1935. (n.d.). Retrieved from Social Security Administration: http://www.ssa.gov/history/35act.html#TITLE III

Thurm, S. (2012, April 9). *For Big Companies, Life is Good*. Retrieved from The Wall Street Journal: http://online.wsj.com/news/articles/SB10001424052702303815404577331660464739018

Valletta, R., & Kuang, K. (2012, January 30). Why Is Unemployment Duration So Long? *Federal Reserve Bank of San Francisco Economic Letter* .

Whittaker, J. M., & Isaacs, K. P. (2014). *Unemployment Insurance: Programs and Benefits.* Congressional Reserach Service. http://www.fas.org/sgp/crs/misc/RL33362.pdf.

Winter-Ebmer, R. (2001). Benefit duration and unemployment entry: A quasi-experiment in Austria. *European Economic Review* .

Data Sources

CPS Data from IPUMS:
https://cps.ipums.org/cps/

CPS description:
http://www.bls.gov/cps/

Annual Social and Economic (ASEC) Supplement survey description:
http://www.icpsr.umich.edu/icpsrweb/RCMD/series/24/studies/29652?paging.startRow=1&recency=YEAR

National Unemployment Rate data:
http://data.bls.gov/pdq/SurveyOutputServlet

State Unemployment Rates data – Local Area Unemployment Statistics (LAUS):
http://www.bls.gov/lau/

Job Openings and Labor Turnover Survey (JOLTS) data:
http://www.bls.gov/jlt/

United States Department of Labor; UI Weekly Claims Data (EB and EUC triggers)
http://www.oui.doleta.gov/unemploy/claims_arch.asp

National Unemployment Duration Data
http://research.stlouisfed.org/fred2/release?rid=50

Table 1: Number of States (and District of Columbia) Eligible for EB and EUC

Program	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
EB-13 weeks	3	1	1	0	0	0	15	7	5	7	1
EB-20 weeks	0	0	0	0	0	0	3	31	31	24	0
EB- Total	3	1	1	0	0	0	18	38	36	31	1
EUC											
Tier 1	-	-	-	-	-	-	51	51	51	51	51
Tier 2	-	-	-	-	-	-	35	51	51	51	39
Tier 3	-	-	-	-	-	-	-	48	46	44	27
Tier 4	-	-	-	-	-	-	-	29	29	23	8

Numbers taken from March of each year

Table 2: Weeks of Eligibility over EUC's Lifetime

July 6, 2008- Nov. 23, 2008	Nov. 24, 2008- Nov. 7, 2009	Nov. 8, 2009- Feb. 18, 2012	Feb. 19, 2012- May 26, 2012	May 27, 2012- Sep. 1, 2012	Sep. 2, 2012- Dec. 28, 2013
13 weeks -all states	Tier I: 20 weeks -all states Tier II: 13 weeks -if state TUR>6%	Tier I: 20 weeks -all states Tier II: 14 weeks -all states Tier III: 13 weeks -if state TUR>=6% Tier IV: 6 weeks -if state TUR>=8.5%	Tier I: 20 weeks -all states Tier II: 14 weeks -all states Tier III: 13 weeks -if state TUR>=6% Tier IV: 6 weeks -if state TUR>=8.5%*	Tier I: 20 weeks -all states Tier II: 14 weeks -if state TUR>=6% Tier III: 13 weeks -if state TUR>=7% Tier IV: 6 weeks -if state TUR>=9%	Tier I: 14 weeks -all states Tier II: 14 weeks -if state TUR>=6% Tier III: 9 weeks -if state TUR>=7% Tier IV: 10 weeks -if state TUR>=9%

*16 weeks if no active EB and TUR >=8.5% (Whittaker & Isaacs, 2014)

Table 3: Unemployed persons by duration of unemployment

	Not seasonally adjusted		
NUMBER OF UNEMPLOYED	**Feb 2013**	**Jan 2014**	**Feb 2014**
Less than 5 weeks	2440	2876	2145
5 to 14 weeks	3366	2587	3091
15 weeks and over	6694	5392	5657
15 to 26 weeks	1903	1702	1771
27 weeks and over	4791	3690	3886
Average (mean) duration, in weeks	36	33.3	36.3
Median duration, in weeks	17.1	14.3	16
PERCENT DISTRIBUTION			
Less than 5 weeks	19.5	26.5	19.7
5 to 14 weeks	26.9	23.8	28.4
15 weeks and over	53.6	49.7	51.9
15 to 26 weeks	15.2	15.7	16.3
27 weeks and over	38.3	34	35.7

Updated population controls are introduced annually with the release of January data.
Taken from BLS

Table 4: Unemployed persons by duration of unemployment

	Seasonally adjusted					
NUMBER OF UNEMPLOYED	**Feb 2013**	**Oct. 2013**	**Nov 2013**	**Dec 2013**	**Jan 2014**	**Feb 2014**
Less than 5 weeks	2677	2794	2439	2255	2434	2373
5 to 14 weeks	2788	2636	2585	2506	2429	2568
15 weeks and over	6485	5824	5786	5530	5336	5464
15 to 26 weeks	1735	1777	1742	1651	1689	1615
27 weeks and over	4750	4047	4044	3878	3646	3849
Average (mean) duration, in weeks	36.9	36	37.1	37.1	35.4	37.1
Median duration, in weeks	17.7	16.5	17	17.1	16	16.4
PERCENT DISTRIBUTION						
Less than 5 weeks	22.4	24.8	22.6	21.9	23.9	22.8
5 to 14 weeks	23.3	23.4	23.9	24.4	23.8	24.7
15 weeks and over	54.3	51.7	53.5	53.7	52.3	52.5
15 to 26 weeks	14.5	15.8	16.1	16	16.6	15.5
27 weeks and over	39.7	36	37.4	37.7	35.8	37

Updated population controls are introduced annually with the release of January data.
Taken from BLS

Table 5: Summary Statistics 2003-2013 CPS

Variable	Mean	Standard Deviation	N
Dependent Variables			
Unemployment Duration	24.46	27.130	77,229
Long-term Duration	60.40	24.740	22,196
Individual			
Age	45.69	23.829	592,459
Gender (Female = 1)	0.60	0.490	592,459
At Least HS Degree	0.65	0.478	592,459
At Least Bachelor's Degree	0.15	0.361	592,459
Marital Status (Married = 1)	0.43	0.495	592,459
Max Weeks of UI (*MaxUI*)	50.27	29.249	592,459
Race			
White (Reference)	0.78	0.416	592,459
Black	0.13	0.333	592,459
Asian	0.05	0.224	592,459
American Indian	0.02	0.124	592,459
Hawaiian/Pacific Islander	0.004	0.066	592,459
Other (2+ races)	0.02	0.147	592,459
Household			
Total Family Income	57,239	69,439	592,459
Living in Metro area (Yes = 1)	0.78	0.412	564,776
Labor Market			
State Unemployment Rates	6.63	2.315	592,459
National Unemployment Rate	6.85	1.863	592,459
Job Openings (000s)	3,571	675.646	592,459

Table 6: JOLTS Data Definitions

JOLTS DATA	Calculation
Job Openings Level	Total number of openings (presented in thousands)
Job Openings Rate	Number of openings divided by (employment plus job openings)
Hiring Rate	Number of hires as a percent of total employment
Turnover (Separations) Rate	Number of total separations as a percent of total employment
Quits Rate	Number of quits as a percent of total employment
Layoffs & Discharge Rate	Number of Layoffs & Discharges as a percent of total employment

National level data

Table 7: Full Unemployment Duration Results using 2003-2013 CPS

Variable	OLS	State Fixed Effects	State and Year Fixed Effects
MaxUI	0.162***	0.170***	0.077***
	(0.012)	(0.013)	(0.019)
Age	0.320***	0.315***	0.315***
	(0.008)	(0.008)	(0.008)
Gender (female=1)	-1.545***	-1.509***	-1.608***
	(0.198)	(0.198)	(0.197)
At Least HS Graduate	1.540***	1.456***	1.402***
	(0.239)	(0.239)	(0.238)
At Least Bachelor's Degree	1.963***	1.822***	1.724***
	(0.294)	(0.295)	(0.293)
Marital Status (married=1)	-1.458***	-1.392***	-1.386***
	(0.230)	(0.230)	(0.229)
Black	5.535***	5.258***	5.204***
	(0.252)	(0.263)	(0.262)
Asian	4.219***	4.176***	4.066***
	(0.532)	(0.537)	(0.535)
American Indian	2.658***	3.177***	3.117***
	(0.867)	(0.882)	(0.878)
Hawaiian/Pacific Islander	4.071**	3.987**	3.827**
	(1.639)	(1.665)	(1.659)
Other races (2+)	2.769***	2.877***	2.884***
	(0.664)	(0.669)	(0.666)
Total family income (000s)	-0.050***	-0.052***	-0.051***
	(0.002)	(0.002)	(0.002)
Living in a metro area	1.358***	0.650**	0.741**
	(0.270)	(0.295)	(0.294)
State unemployment rate	1.101***	1.113***	1.293***
	(0.077)	(0.131)	(0.137)
National unemployment rate	0.511**	0.330	0.530
	(0.245)	(0.282)	(0.360)
National job openings (000s)	0.004***	0.004***	0.001**
	(0.0003)	(0.0004)	(0.001)
Constant	-22.681***	-22.331***	-10.748
R^2	.1122	.1160	.1232
N	73,489	73,489	73,489

Standard errors in parentheses

Legend: * p<.1; ** p<.05; *** p<.01

Table 8: Long-Term Duration Results using 2003-2013 CPS

Variable	OLS	State Fixed Effects	State and Year Fixed Effects
MaxUI	0.167***	0.175***	0.155***
	(0.019)	(0.021)	(0.032)
Age	0.248***	0.245***	0.243***
	(0.013)	(0.013)	(0.013)
Gender (female=1)	-1.456***	-1.433***	-1.575***
	(0.335)	(0.336)	(0.335)
At Least HS Graduate	-0.046	-0.059	-0.137
	(0.427)	(0.428)	(0.427)
At Least Bachelor's Degree	0.119	0.103	-0.023
	(0.467)	(0.469)	(0.467)
Married	-0.439	-0.402	-0.410
	(0.383)	(0.384)	(0.383)
Black	1.945***	2.049***	2.071***
	(0.401)	(0.422)	(0.421)
Asian	2.516***	2.368***	2.369***
	(0.823)	(0.835)	(0.832)
American Indian	3.322**	3.339**	3.3482*
	(1.503)	(1.540)	(1.536)
Hawaiian/Pacific Islander	1.448	1.034	0.754
	(2.574)	(2.641)	(2.633)
Other races (2+)	2.608**	2.611**	2.592**
	(1.115)	(1.124)	(1.120)
Total family income (000s)	-0.040***	-0.041***	-0.041***
	(0.003)	(0.003)	(0.003)
Living in a metro	0.844*	0.399	0.356
	(0.483)	(0.531)	(0.529)
State unemployment rate	0.500***	0.052	0.011
	(0.124)	(0.231)	(0.238)
National unemployment rate	-0.470	-0.186	0.827
	(0.411)	(0.500)	(0.720)
National job openings (000s)	0.006***	0.006***	0.003***
	(0.001)	(0.001)	(0.001)
Constant	20.171***	20.097**	26.122**
R^2	.0686	.0712	.0776
N	21,377	21,377	21,377

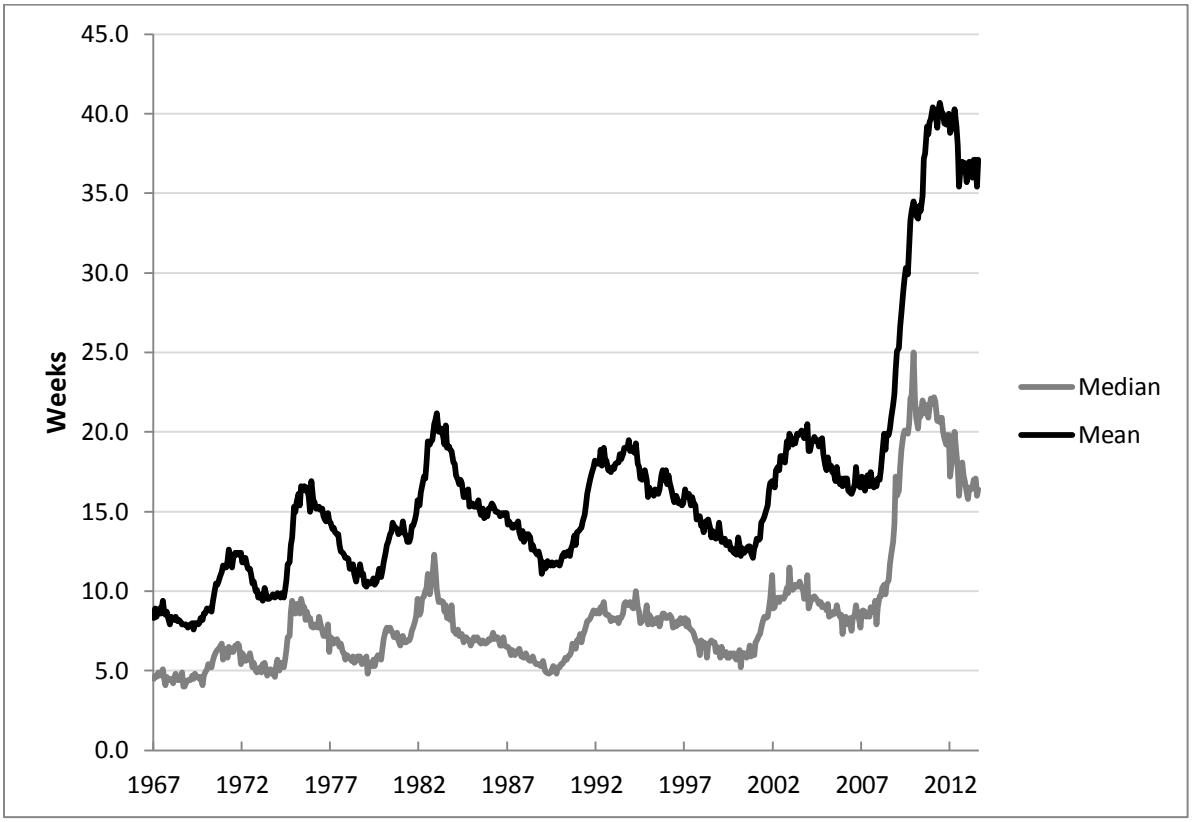
Standard errors in parentheses

Legend: * p<.1; ** p<.05; *** p<.01

Unemployment Duration Measurement Changes

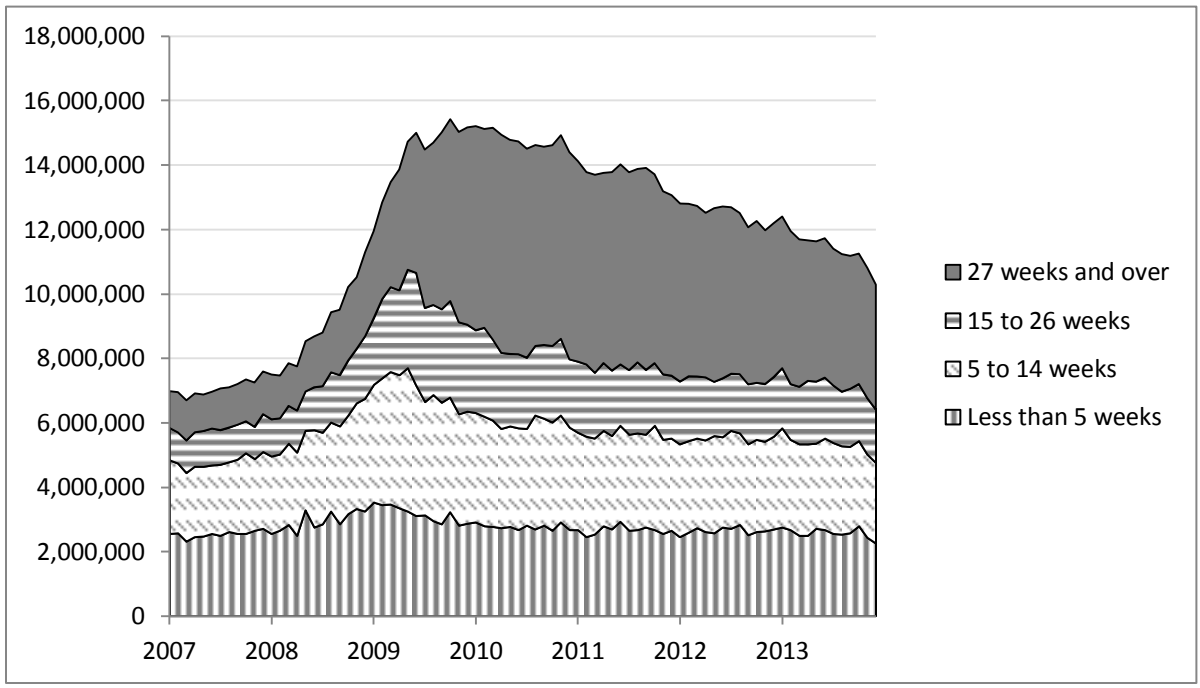
In 2011 the Consumer Population Survey (CPS) made a slight change in how it top-coded the maximum number of weeks of unemployment duration. The previous maximum was 99 weeks, meaning that if an individual had been unemployed for 110 weeks it would be recorded as 99 weeks. A change was made during the recession to increase the maximum weeks of unemployment duration from 99 to 117 weeks, and then in 2011 up to 260 weeks where it currently stands. The BLS reports that only the average was affected by this change, while the median and distribution of unemployment by weeks unemployed were not affected (2011). The national average unemployment duration increased by about three weeks as a result of this measurement change, which is relatively small change compared to the amount duration increased during that period (Valletta & Kuang, 2012).

Figure 1: US Unemployment Duration 1967-2013



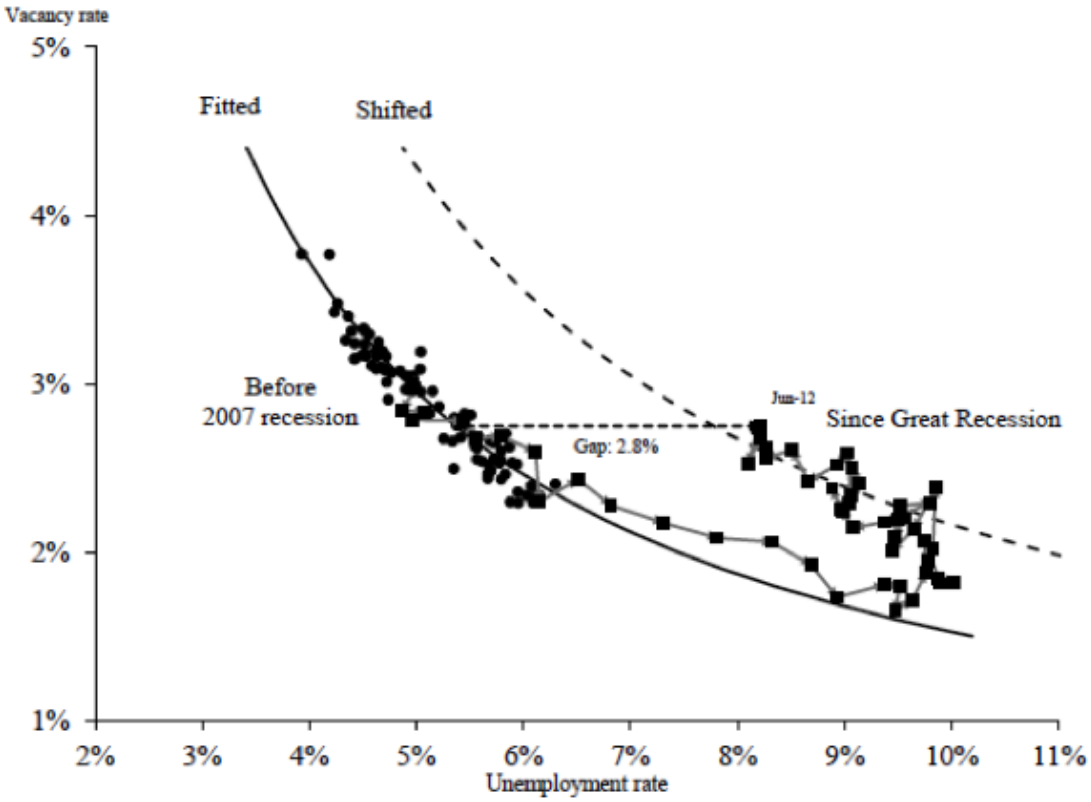
(Federal Reserve Bank of St. Louis, 2014)

Figure 2: Number of unemployed persons by duration of unemployment, US 2007-2013



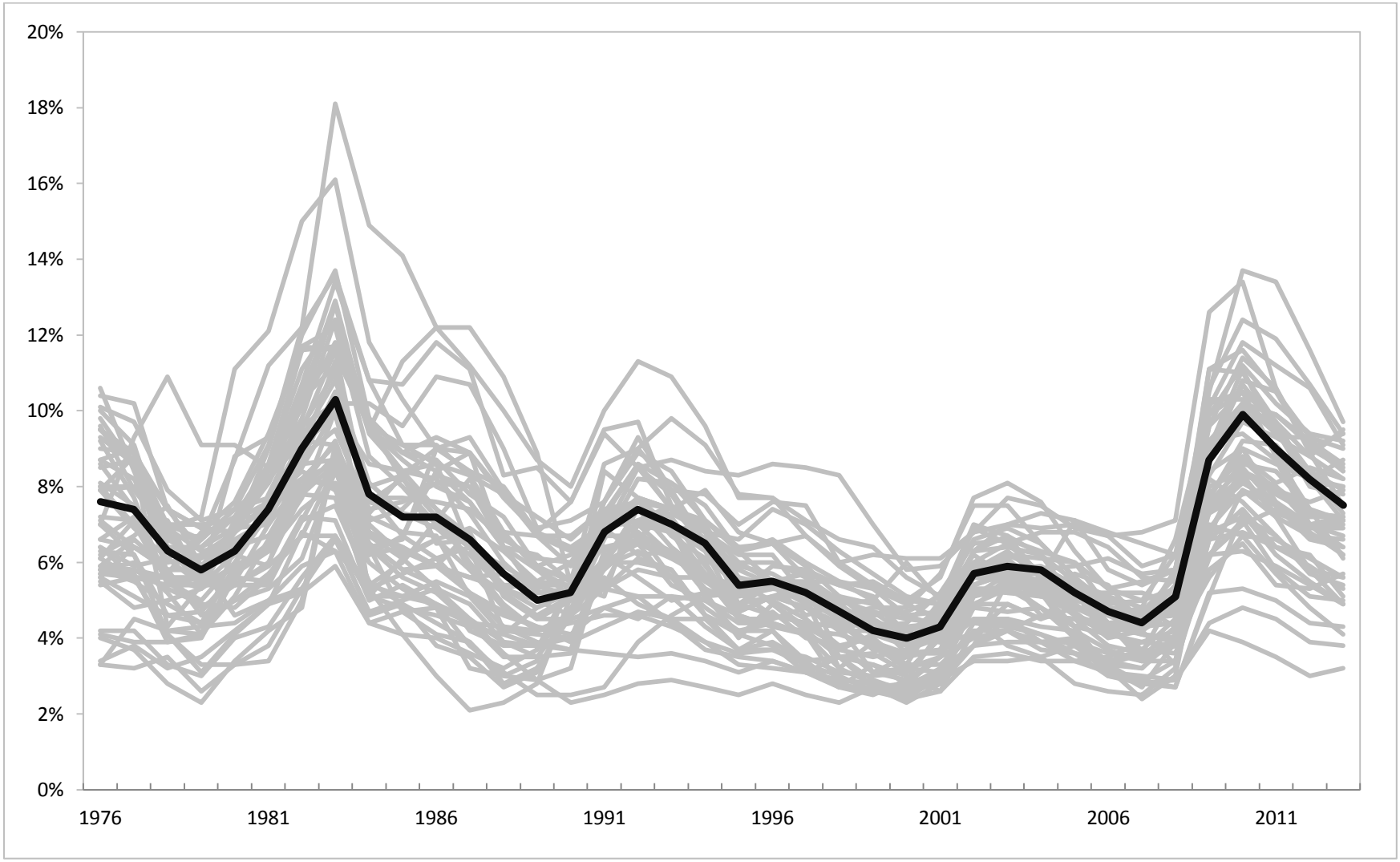
Numbers are seasonally adjusted (BLS, 2014c)

Figure 3: U.S. Beveridge Curve: Dec. 2000 – June 2012



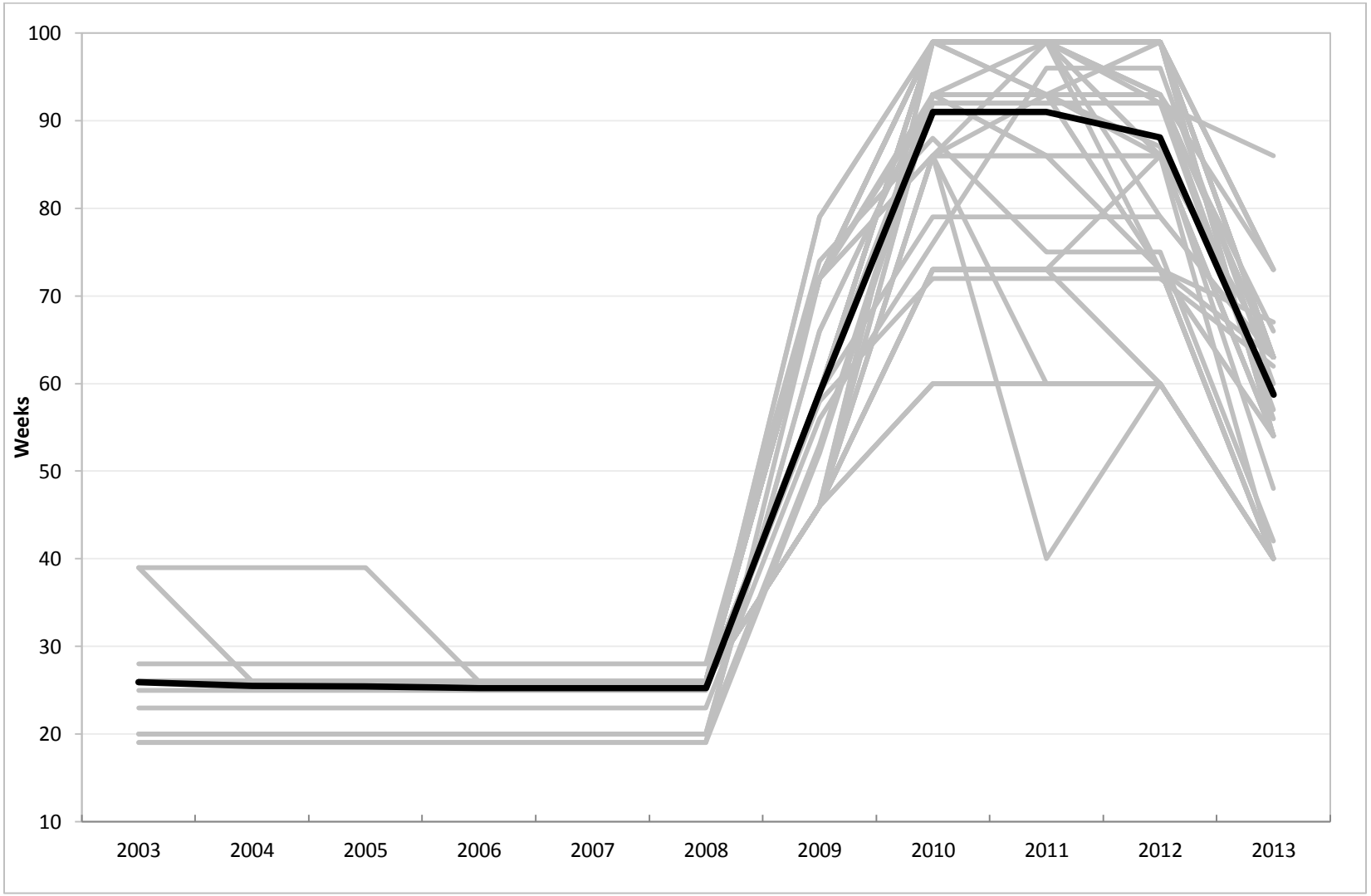
Source: JOLTS and authors' calculations, based on Barnichon et al. (2012).

Figure 4: Variation in State Unemployment Rates compared to US Unemployment Rate (BLS)



Black line = national unemployment rate, gray lines represent the 50 states (and District of Columbia)

Figure 5: Variation in *MaxUI* across States, 2003-2013



Black line = National Sample Average, gray lines represent the 50 states (and District of Columbia)